In the United States Court of Federal Claims

OFFICE OF SPECIAL MASTERS

MICHAEL MOSES, parent on behalf of P.M., a minor,	*	No. 19-739V
Petitioner,	*	Special Master Christian J. Moran
v.	*	Filed: May 18, 2022
SECRETARY OF HEALTH AND HUMAN SERVICES,	*	Entitlement; measles, mumps, and rubella ("MMR") vaccine; pneumococcal conjugate vaccine; varicella vaccine; systemic juvenile idiopathic arthritis ("sJIA")
Respondent.	*	

Phyllis Widman, Widman Law Firm, LLC, Northfield, NJ, for petitioner;
Catherine Stolar, United States Dep't of Justice, Washington, DC, for respondent.

PUBLISHED DECISION DENYING COMPENSATION[1]

Michael Moses claims that the measles, mumps, and rubella ("MMR"), pneumococcal conjugate, and varicella vaccines his son, P.M., received caused him to develop systemic juvenile idiopathic arthritis ("sJIA"). The parties have submitted reports from experts and argued their positions through legal briefs. Mr. Moses has not shown that the MMR, pneumococcal conjugate, or varicella vaccines can cause sJIA. Additionally, Mr. Moses has not demonstrated a logical sequence of cause and effect connecting the vaccines to P.M.'s condition. Further, Mr. Moses has not put forth a medically acceptable timeframe from which to infer

[1] The E-Government Act, 44 U.S.C. § 3501 note (2012) (Federal Management and Promotion of Electronic Government Services), requires that the Court post this decision on its website. This posting will make the decision available to anyone with the internet. Pursuant to Vaccine Rule 18(b), the parties have 14 days to file a motion proposing redaction of medical information or other information described in 42 U.S.C. § 300aa-12(d)(4). Any redactions ordered by the special master will appear in the document posted on the website.

vaccine-causation. Accordingly, Mr. Moses has not met his burden of establishing that the MMR, pneumococcal conjugate, and varicella vaccines caused P.M.'s sJIA. Thus, his case is dismissed.

I. Facts

P.M. was born via cesarean section on June 4, 2015 and had a normal newborn screening. Exhibit 13 at 15-18. Prior to vaccination, P.M. was relatively healthy with no significant health concerns.

On June 6, 2016, P.M. visited his pediatrician, Katherine Kormanik, M.D., for his twelve-month well visit. Id. at 210. P.M. was growing and developing normally and noted to be a healthy infant. Id. at 220-22. At this visit, P.M. received his MMR, pneumococcal conjugate, and varicella vaccines. Id. at 223; exhibit 1 at 2-4 (vaccination record).

On June 24, 2016, P.M. presented to Dr. Kormanik with complaints of low-grade fevers, waking at night, and fussiness for the last five days. Exhibit 2 at 25. P.M.'s parents reported that P.M. had not been "acting like himself," had been crying while laying down, and had developed a rash with small red spots on his back and abdomen. Id. Dr. Kormanik noted that P.M. had received his MMR vaccine more than two weeks prior. Id. at 28. Upon physical exam, Dr. Kormanik observed a runny nose and fever, swollen gums, a rash on the abdomen and back, and a pustule or papule on the hand. Id. at 29. Dr. Kormanik suspected possible early hand, foot, and mouth syndrome, "viral rash vs MMR side effect," and teething. Id.

P.M. visited Dr. Kormanik's colleague, pediatrician John Goetz, M.D., on June 28, 2016. Id. at 38. Dr. Goetz observed rashes on P.M.'s chest and hand and swollen tonsils. Id. Dr. Goetz diagnosed P.M. with pharyngitis (sore throat) and viral exanthem (rash). Id. at 39. He noted that P.M. had received his MMR and varicella vaccine three weeks earlier. Id.

On July 1, 2016, P.M.'s mother left a voicemail message for Dr. Kormanik, stating that P.M. "seems to 'hurt' when he is moved or his position is changed," and that he still had a rash with fevers. Exhibit 2 at 50.

P.M. returned to Dr. Kormanik on July 2, 2016. Id. at 54. P.M.'s parents reported that P.M. would "cry in pain with movements" and did "not want to move as much as he did prior to becoming ill." Id. at 55. Mr. Moses asked if "[P.M.'s]

'bones hurt' given how small movements . . . can cause him to cry significantly." Id. Dr. Kormanik observed a blanching, maculopapular rash scattered across P.M.'s abdomen, back, and legs, a blister-like lesion on P.M.'s left hand, enlarged tonsils, and swollen hands and feet. Id. at 56. Dr. Kormanik diagnosed P.M. with post-strep glomerulonephritis, atypical Kawasaki disease, and nephrotic syndrome. Id. Dr. Kormanik recommended that P.M.'s parents take him to the emergency room.

Following the appointment with Dr. Kormanik, P.M. went to the emergency room on July 2, 2016. Exhibit 5 at 3. His parents reported that P.M. had a rash for the past twelve days and a fever for the past nine days. Id. Rheumatologist James Nocton, M.D., examined P.M. Dr. Nocton noted that P.M.'s lesion on his left hand and his fever indicated "potential coxsackie virus infection," but the prolonged duration of his fevers, extremity swelling, and rash were "not typical for coxsackievirus." Id. at 19. Additionally, Dr. Nocton stated that P.M.'s erythrocyte sedimentation rate was "somewhat disproportionate for a viral illness." Id.

While at the hospital, P.M.'s rash and fever improved with IVIg, methylprednisolone, and solumedrol therapy. Id. at 24, 28; see also id. at 189 (Dr. Nocton's record). P.M. was discharged from the hospital on July 6, 2016, after being fever free for 36 hours. Id. at 26-27. His diagnosis at discharge was "incomplete Kawasaki disease." Id. at 7.

On July 7, 2016, P.M. saw Dr. Kormanik for a fever. Exhibit 2 at 75. P.M.'s parents noted that he was "just as fussy as when he was admitted" to the hospital on July 2, 2016. Id. Dr. Kormanik observed that P.M. was uncomfortable, cried with movement, and had a rash on his left lower leg and upper chest. Id. at 76. Dr. Kormanik's assessment was "[i]ncomplete Kawasaki disease with continued fevers." Id. She prescribed prednisolone. Id. at 74.

P.M. visited Dr. Nocton for a follow-up appointment on July 11, 2016. Exhibit 5 at 188. Dr. Nocton noted that P.M.'s recurrence of his fever and rash, irritability in the morning, worsening anemia, and elevated white blood cell and platelet counts were more consistent with sJIA than Kawasaki's disease. Id. at 191. Dr. Nocton wrote, "This form of arthritis often starts with fever and rash in a characteristic pattern of 1-2 temp spikes each day with an evanescent, salmon-colored macular rash that comes and goes with the fever." Id.

When P.M.'s fever and rash did not resolve, he was readmitted to the hospital on July 14, 2016. Exhibit 5 at 231-32. At the hospital, P.M. was

examined by rheumatologist Judyann Olson, M.D. Dr. Olson wrote that P.M.'s differential diagnosis included "systemic JIA vs incomplete [K]awasaki disease vs macrophage activation syndrome [(MAS)]." Id. at 252. Dr. Olson started P.M. on anakinra. Id. Anakinra is a medication to respond to inflammation in rheumatoid arthritis. Dorland's Illus. Med. Dictionary 70 (33d ed. 2020).

Infectious disease specialist Michael Chusid, M.D., examined P.M. on July 17, 2016. Id. at 237. Dr. Chusid noted that P.M.'s fevers "started . . . approximately 10 days after receipt of an MMR vaccination." Id. Dr. Chusid "[s]trongly suspect[ed] MMR was [the] trigger" for P.M.'s illness due to the "temporal association." Id. at 239. Dr. Chusid advised P.M. to avoid future live vaccines, including a second MMR vaccine and a live influenza vaccine, "unless the mechanism of his disease becomes better elucidated." Id. at 240.

P.M. was discharged from the hospital on July 19, 2016. Exhibit 5 at 229-31. P.M. had not developed any rashes during his hospitalization. Id. at 230. Additionally, since beginning anakinra, P.M.'s fever had gone down. Id. At discharge, his diagnoses were MAS and systemic onset JIA. Id. at 229.

On July 25, 2016, P.M. saw Dr. Nocton for a follow-up appointment. Id. at 473-75. Since his discharge from the hospital, he had not had a fever, rash, joint pain, or swelling, and his energy level was almost back to baseline. Id. at 474. Dr. Nocton stated that P.M.'s fever pattern of high spikes once to twice a day, fine macular rash, leukocytosis, anemia, and thrombocytosis were consistent with systemic onset JIA. Id. Dr. Nocton noted that P.M. "never developed the classic systemic JIA rash" or "objective" arthritis. Id. However, Dr. Nocton opined that his "fever pattern," possible arthralgias, and laboratory test results indicated that he would have developed "a more characteristic and recognizable systemic JIA pattern," had his physicians not "treat[ed] him early, initially with IVIG and steroids, and then subsequently with anakinra." Id. Dr. Nocton concluded that P.M.'s "marked elevation of transaminases, subsequent fall in his [white blood cells], hemoglobin, and platelets, and extreme elevation of the ferritin" were consistent with MAS. Id.

P.M. saw Dr. Nocton again on August 10, 2016. Exhibit 6 at 6-7. P.M.'s parents reported that he was doing well, was not experiencing symptoms, and remained on anakinra. Id.

P.M. periodically followed up with Dr. Nocton over the next two-and-a-half years. See exhibits 6-12, 15-16. P.M. seemed to be growing and developing

normally, so his parents and Dr. Nocton tried to wean him off anakinra on several occasions. However, Dr. Nocton increased P.M.'s dose or restarted anakinra a few times due to concern about possible recurrence of symptoms. See, e.g., exhibit 8 at 79 (anakinra restarted after P.M. experienced a recurrence of irritability, rash, lethargy, and intermittent abnormal gait).

On February 15, 2019, P.M. visited Dr. Nocton for a follow-up appointment. Dr. Nocton noted that P.M. "continued to do very well" and recommended that he stop anakinra. Exhibit 15 at 131-33. Dr. Nocton suggested discontinuation of anakinra because P.M. seemed to be doing well even as his parents weaned him off. Dr. Nocton noted that P.M. "ha[d] been asymptomatic with a normal physical examination and normal laboratory tests despite decreasing the frequency of anakinra to every seventh day." Id. at 133. Additionally, Dr. Nocton told P.M.'s parents that he showed "no sign of active systemic onset JIA." Id. Dr. Nocton recommended that P.M. receive the MMR vaccine, which he was unable to do while on anakinra. Id.

The last medical record with Dr. Nocton is from April 1, 2019. At this visit, P.M.'s parents reported that P.M. had been receiving anakinra once every seven days and not received anakinra in the last week. Dr. Nocton again recommended that his parents discontinue anakinra so that P.M. could receive the MMR vaccination. Exhibit 16 at 161-63.

P.M. saw pediatrician Sarah Gaethke, M.D., for a five-year well visit on November 25, 2020. Exhibit 47 at 17. Dr. Gaethke noted that P.M.'s mother declined to allow P.M. to receive varicella and MMR vaccines. Dr. Gaethke wrote that there was "no reason not to give live vaccines" because P.M. was "no longer on immune suppression and [Dr. Nocton] did not feel that the vaccines were the cause of the original symptoms." Id. at 20.

On October 1, 2020, Kristin Moeller, R.N., wrote that Dr. Kormanik and P.M.'s rheumatologist "recommended" that P.M. receive the MMR vaccine, but P.M.'s father declined to consent. Id. at 40. On October 5, 2020, P.M.'s mother asked Dr. Kormanik to sign a school waiver excusing P.M. from getting the MMR vaccine. Id. at 34. A member of the nursing staff informed P.M.'s mother via email that Dr. Kormanik could not sign the waiver because "[s]he cannot say that MMR is medically contraindicated as we do not know for certain that this was a cause of [P.M.'s] JIA." Id. at 35. Dr. Kormanik followed up with P.M.'s mother via email, stating that there was "no medical evidence to link MMR to the cause of

[P.M.'s] JIA for [her] to sign the waiver." Id. Dr. Kormanik suggested that P.M.'s mother reach out to P.M.'s rheumatologist for additional advice. Id.

No additional medical records relating to P.M.'s condition have been filed.

II. Procedural History

Mr. Moses filed a petition for compensation on behalf of P.M. on May 17, 2019. Pet., filed May 17, 2019. He filed medical records on May 20, 2019. The Secretary reviewed this material and recommended that compensation be denied. Resp't's Rep., filed Sept. 23, 2019. The Secretary argued that Mr. Moses failed to offer a theory connecting the vaccines to P.M.'s condition, and that temporal association alone was not enough to meet his burden. Id. at 13-15.

The parties then proceeded to the expert report stage. To advance his case, Mr. Moses presented an initial report from Arthur E. Brawer, M.D., on March 20, 2020. Exhibit 19. Due to deficiencies in Dr. Brawer's first report, he was ordered to submit a supplemental report. Order, issued Mar. 24, 2020. Dr. Brawer submitted a supplemental report on August 7, 2020. Exhibit 32. The Secretary then submitted a report from Craig D. Platt, M.D., Ph.D., on December 4, 2020, and a report from Carlos D. Rose, M.D., on December 11, 2020. Exhibits C and E. Mr. Moses submitted a rebuttal report from Dr. Brawer on March 19, 2021. Exhibit 38. The Secretary then provided responsive reports from Dr. Rose and Dr. Platt on May 3, 2021. Exhibits F and G. The parties also filed several medical articles their experts cited.

Following the completion of the expert report stage, the parties were instructed to file briefs advocating for their positions. Order, issued June 22, 2021. Mr. Moses filed a brief in support of entitlement on September 20, 2021, and the Secretary submitted his brief on December 3, 2021. Mr. Moses submitted a reply brief on January 3, 2022. The case is now ready for adjudication.

III. Standards for Adjudication

A petitioner is required to establish his case by a preponderance of the evidence. 42 U.S.C. § 300aa-13(1)(a). The preponderance of the evidence standard requires a "trier of fact to believe that the existence of a fact is more probable than its nonexistence before [he] may find in favor of the party who has the burden to persuade the judge of the fact's existence." Moberly v. Sec'y of Health & Hum. Servs., 592 F.3d 1315, 1322 n.2 (Fed. Cir. 2010) (citations omitted). Proof of

medical certainty is not required. Bunting v. Sec'y of Health & Hum. Servs., 931 F.2d 867, 873 (Fed. Cir. 1991).

Distinguishing between "preponderant evidence" and "medical certainty" is important because a special master should not impose an evidentiary burden that is too high. Andreu v. Sec'y of Health & Hum. Servs., 569 F.3d 1367, 1379-80 (Fed. Cir. 2009) (reversing a special master's decision that petitioners were not entitled to compensation); see also Lampe v. Sec'y of Health & Hum. Servs., 219 F.3d 1357 (Fed. Cir. 2000); Hodges v. Sec'y of Health & Hum. Servs., 9 F.3d 958, 961 (Fed. Cir. 1993) (disagreeing with the dissenting judge's contention that the special master confused preponderance of the evidence with medical certainty).

When pursuing an off-Table injury, a petitioner bears a burden "to show by preponderant evidence that the vaccination brought about [the vaccinee's] injury by providing: (1) a medical theory causally connecting the vaccination and the injury; (2) a logical sequence of cause and effect showing that the vaccination was the reason for the injury; and (3) a showing of a proximate temporal relationship between vaccination and injury." Althen v. Sec'y of Health & Hum. Servs., 418 F.3d 1274, 1278 (Fed. Cir. 2005).

IV. Analysis

A. Althen Prong 1: A Causal Theory Connecting the Vaccine to P.M.'s Injury

The first Althen prong requires the petitioner to provide a "sound and reliable" medical theory demonstrating that the vaccine can cause the alleged injury. Boatmon v. Sec'y of Health & Hum. Servs., 941 F.3d 1351, 1359 (Fed. Cir. 2019) (quoting Knudsen v. Sec'y of Health & Hum. Servs., 35 F.3d 543, 548 (Fed. Cir. 1994)). The petitioner must also offer "a reputable or scientific explanation that pertains specifically to [his] case." Moberly, 592 F.3d at 1322.

Through Dr. Brawer, Mr. Moses has attempted to present three theories by which the MMR, pneumococcal conjugate, and varicella vaccines can cause sJIA.[2] Dr. Brawer opined that molecular mimicry, channelopathies, and mitochondrial

[2] The Secretary noted that Dr. Brawer did not distinguish between the three vaccines when providing his causation theories. See Resp't's Br., filed Dec. 3, 2021, at 27.

dysfunctions are all potential mechanisms for causation. However, these theories lack persuasiveness. Each theory is discussed individually below.

1. Molecular Mimicry

Dr. Brawer presented molecular mimicry as a potential theory, explaining that "vaccine antigens of infectious agents can cross-react with self antigens present on a variety of body cells, including immunocompetent cells, thereby triggering systemic inflammatory reactions." Exhibit 19 at 3.

Dr. Brawer relied on an experimental study in mice to support molecular mimicry as a mechanism for causation. Exhibit 29 (Marijana Stojanović et al., Role of Molecular Mimicry and Polyclonal Cell Activation in the Induction of Pathogenic ß2-Glycoprotein I-Directed Immune Response, 56 J. Immunology Rsch. 20 (2012)). The study found that "molecular mimicry has played a role in the rise of" autoantibodies against glycoproteins following immunization with the tetanus toxoid. Exhibit 29 at 26. Dr. Brawer cited another animal study that tested the induction of bystander activation in mice. Exhibit 30 (Susan van Aalst et al., Bystander Activation of Irrelevant CD4+ T Cells Following Antigen-Specific Vaccination Occurs in the Presence and Absence of Adjuvant, PLoS ONE (May 10, 2017)). The study found that an antigen-specific response led to bystander activation in mice. Id. at 9. However, the study's authors stated that "clear evidence of vaccine-induced [autoimmune diseases] is not yet established." Id.

Dr. Platt challenged Dr. Brawer's molecular mimicry theory, claiming that molecular mimicry is not part of the etiology of sJIA. Dr. Platt stated, "Dr. Brawer does not provide any references that support a 'molecular mimicry' mechanism for sJIA" involving "cross reactivity between a vaccine antigen and a channel protein." Exhibit C at 7. Dr. Platt relied on an article that concluded sJIA has no connection to autoantibodies or activation of the immune system. See exhibit C, tab 1 (Berent Prakken et al., Juvenile Idiopathic Arthritis, 377 Lancet 2138 (2011)). Another article stated that "systemic JIA is an autoinflammatory disease rather than a classical antigen driven lymphocyte-mediated autoimmune disease." Exhibit C, tab 3 (Yu-Tsan Lin et al., The Pathogenesis of Oligoarticular/Polyarticular vs Systemic Juvenile Idiopathic Arthritis, 10 Autoimmunity Revs. 482 (2011)). Similarly, Dr. Rose stated, "Autoantibodies and antigen specific T cells are not found in patients with sJIA." Exhibit E at 25. The Secretary also noted that one of Dr. Brawer's references acknowledges that sJIA is an autoinflammatory disease, not an autoimmune disease. Resp't's Br., filed Dec.

3, 2021, at 22-23 (citing exhibit 36 (F. Ciccarelli et al., An Update on Autoinflammatory Diseases, 21 Current Medicinal Chemistry 261 (2014)) at 266).

Dr. Platt and Dr. Rose persuasively explained why Dr. Brawer's theory regarding the role molecular mimicry in sJIA is untenable. Given that sJIA is autoinflammatory in nature and has no relationship to autoantibodies, Dr. Brawer's molecular mimicry theory lacks persuasiveness.

2. Channelopathies

Dr. Brawer offered the theory that vaccines contain toxic chemicals that can trigger channelopathies, thus causing sJIA. Specifically, Dr. Brawer asserted that the vaccines P.M. received can trigger ion channel autoantibodies. Exhibit 19 at 2. Dr. Brawer opined that "physiological disruption of regulatory T cell channel functions can occur upon exposure to chemicals present in vaccines," including organosiloxanes and silica. Exhibit 32 at 2. He explained that organosiloxanes are "capable of adhering to any protein, including channel proteins, via hydrophobic bonding, therefore inducing conformational changes that translate into altered channel functions." Id.

To support this theory, Dr. Brawer cited an article that describes calcium signaling and ion channels in neutrophil function. Exhibit 32 (citing exhibit 23 (Roland Immler et al., Calcium Signalling and Related Ion Channels in Neutrophil Recruitment and Function, 48 European J. Clinical Investigation 12964 (2018)). Dr. Brawer did not elaborate on how this article supports his theory in his expert report. See id. Additionally, he referenced articles discussing cardiac channelopathies (exhibit 20), autoimmune neuromyotonia (exhibit 21), and genetic neurological channelopathies (exhibit 22).[3] To establish the applicability of this theory to the vaccines P.M. received, Dr. Brawer relied on a list of vaccines, including the pneumococcal and MMR vaccines, that purportedly contain toxic chemicals that can trigger channelopathies. See exhibit 40; exhibit 35 at 2.

[3] Exhibit 20 (Pietro Enea Lazzerini et al., Autoimmune Channelopathies as a Novel Mechanism in Cardiac Arrhythmias, 14 Nature Revs. Cardiology 521 (2017)); exhibit 21 (Chiara Cerami et al., Autoimmune Neuromyotonia Following Human Papilloma Virus Vaccination, 43 Muscle & Nerve 466 (2013)); exhibit 22 (J. Spillane et al., Genetic Neurological Channelopathies: Molecular Genetics and Clinical Phenotypes, 87 J. Neurology, Neurosurgery & Psychiatry 37 (2016)).

Both Dr. Platt and Dr. Rose disputed Dr. Brawer's theory that the vaccines P.M. received can trigger channelopathies and cause sJIA. The experts challenged the relevancy of the articles Dr. Brawer relied on to support this theory. Dr. Platt claimed that the Immler article (exhibit 23) "does not show that there are antibodies generated against neutrophil ion channels that cause an autoinflammatory disorder such as sJIA, nor any other human disease." Exhibit C at 8. Dr. Platt noted that with the channelopathies discussed in exhibits 20 and 21, such as cardiac arrhythmias and autoimmune neuromyotonia, scientists have observed a "direct relationship between disruption of channel function and disease pathophysiology." Exhibit C at 8 (citing exhibit 20 at 12, exhibit 21 at 2). However, Dr. Platt asserted, unlike with the other channelopathies, there is no evidence in the medical literature of a direct relationship between ion channel dysfunction and sJIA. Id. at 6.

Additionally, Dr. Rose pointed out that "nowhere in the literature has there been . . . a claim or suggestion that sJIA has anything to do with an abnormality of the conductivity of cells nor with the function of gated ion channels." Exhibit E at 32. Given that Dr. Brawer only referenced medical literature discussing channelopathies in unrelated diseases, the Secretary argued that Dr. Brawer's theory lacks support. Resp't's Br. at 25-26.

Further, the Secretary asserted that there is no credible evidence that the pneumococcal conjugate and MMR vaccines contain the chemicals that Dr. Brawer claims are toxic and trigger channelopathies. He argued that the list of vaccines containing toxic chemicals that Dr. Brawer relied on "has no supporting citations" and "cannot be verified." Resp't's Br. at 25. He added, "The lack of reputable research to support Dr. Brawer's opinion regarding vaccine toxicity renders it of limited value in this case, and should be afforded little evidentiary weight by this court. Id. (citing McCabe v. Sec'y of Health & Hum. Servs., No. 13-570V, 2018 WL 3029175, at *53 (Fed. Cl. Spec. Mstr. May 17, 2018)).

Dr. Platt and Dr. Rose identified several gaps in Dr. Brawer's channelopathies theory. Furthermore, the references Dr. Brawer provided to show that the MMR and pneumococcal conjugate vaccines contain toxic chemicals, such as organosiloxanes and silica, lack credibility. Thus, Mr. Moses has failed to establish, by preponderant evidence, that the vaccines P.M. received contain toxic chemicals that trigger channelopathies. Therefore, Mr. Moses's channelopathies theory does not satisfy his burden under Althen prong one.

3. Mitochondrial Dysfunction

Dr. Brawer also offered mitochondrial dysfunction as a potential mechanism for causation. He opined that "vaccination induced dysfunction of [mitochondrial membrane] ion channels can result in dysfunction and/or spillage of mitochondrial organelles." Exhibit 32 at 2. He explained that this process can result in chronic autoinflammatory or autoimmune diseases. Id.

To support this theory, Dr. Brawer relied on literature discussing mitochondrial dysfunction in diseases other than sJIA. One article discusses the role of mitochondrial dysfunction in cardiovascular, pulmonary, hepatic, neoplastic, and neurological disorders. Exhibit 24 (Charles S. Dela Cruz & Min-Jong Kang, Mitochondrial Dysfunction and Damage Associated Molecular Patterns (DAMPs) in Chronic Inflammatory Diseases, 41 Mitochondrion 37 (2018)). Another article describes how channelopathies can cause mitochondrial dysfunction and lead to inflammation in Alzheimer's disease and osteopenia. Exhibit 26 (Marie Strickland et al., Relationships Between Ion Channels, Mitochondrial Functions and Inflammation in Human Aging, 10 Frontiers in Physiology 158 (2019)) at 10. These articles lack relevance to P.M.'s case because they involve diseases other than sJIA. Dr. Brawer also relied on an article that concludes that environmental pollutants can cause mitochondrial dysfunction in children. Exhibit 25 (Robert K. Naviaux, Cell Danger Response Biology—The New Science that Connects Environmental Health with Mitochondria and the Rising Tide of Chronic Illness, 51 Mitochondrion 40 (2020). However, the Naviaux article does not posit that vaccines are a trigger for mitochondrial dysfunction.

Additionally, Dr. Brawer offered one of his own case reports involving patients who developed rheumatoid arthritis or systemic lupus erythematosus after receiving the flu vaccine. Exhibit 27 (Arthur E. Brawer & Sai Koyoda, The Onset of Rheumatoid Arthritis and Systemic Lupus Erythematosus Following Influenza Vaccination: Report of Three Cases, 4 Clinical Microbiology & Infectious Diseases 1 (2019)). This case report does not involve the MMR, pneumococcal conjugate, or varicella vaccines; instead, it only reports cases involving the influenza vaccine. See id. Additionally, it focuses on rheumatoid arthritis and systemic lupus erythematosus, both autoimmune diseases. Id. As discussed above, sJIA is an autoinflammatory disease. Therefore, this case report has little value in supporting Dr. Brawer's theory regarding mitochondrial dysfunction. Overall, Dr. Brawer was unable to offer any medical literature to support his theory regarding mitochondrial dysfunction. Although literature is not required, Althen, 418 F.3d at

1274, "a scientific theory that lacks any empirical support will have limited persuasive force." Caves v. Sec'y of Health & Hum. Servs., 100 Fed. Cl. 119, 134 (2011), aff'd without opinion, 463 F. App'x 932 (Fed. Cir. 2012).

In sum, Dr. Brawer's opinions regarding the means by which the MMR, pneumococcal conjugate, and varicella vaccines can cause sJIA are not persuasive. Dr. Platt and Dr. Rose identified several flaws and gaps in Dr. Brawer's theories. Therefore, Mr. Moses has not met his burden of proof on Althen prong one.

B. Althen Prong 3: A Showing of a Proximate Temporal Relationship Between Vaccination and P.M.'s Injury

The resolution of the timing prong affects Althen prong two. See Capizzano v. Sec'y of Health & Hum. Servs., 440 F.3d 1317, 1326 (Fed. Cir. 2006). Thus, this prong is addressed before an evaluation of the logical sequence of cause and effect.

The third Althen prong requires the petitioner to show a "proximate temporal relationship" between the vaccination and the alleged injury. Althen, 418 F.3d at 1281. The timing prong of Althen actually contains two parts. A petitioner must show the "timeframe for which it is medically acceptable to infer causation" and the onset of the disease occurred in this period. Shapiro v. Sec'y of Health & Hum. Servs., 101 Fed. Cl. 532, 542-43 (2011), recons. denied after remand on other grounds, 105 Fed. Cl. 353 (2012), aff'd without op., 503 F. App'x 952 (Fed. Cir. 2013). An appropriate temporal interval must align with what is known about the disease's etiology. Veryzer v. Sec'y of Health & Hum. Servs., 100 Fed. Cl. 344, 356 (2011); Bazan v. Sec'y of Health & Hum. Servs., 539 F.3d 1347, 1352 (2008); see also Shapiro v. Sec'y of Health & Hum. Servs., No. 99-552V, 2012 WL 273686, at *11 (Fed. Cl. Spec. Mstr. Jan. 10 2012) (finding that a petitioner's onset of autoimmune thyroid disease occurred too rapidly because the etiology of the disorder "is such that a relatively long interval between vaccination and the onset of symptoms would be expected"), mot. for rev. denied, 105 Fed. Cl. 353 (2012), aff'd, 503 Fed. App'x 952 (2013).

Mr. Moses argued that 1-28 days is a medically acceptable timeframe for onset of sJIA following vaccination. Pet'r's Br., filed Sept. 20, 2021, at 11. In his supplemental report, Dr. Brawer used the appropriate timeframe for onset of rheumatoid arthritis to support this assertion. See exhibit 32 at 2-4. Dr. Brawer claimed that the onset of vaccine-induced rheumatoid arthritis is "highly variable," but offered a range of 1-28 days. Id. at 2. Dr. Brawer discussed examples of

rheumatoid arthritis developing within 24 hours after a triggering event. Id. at 3. He also asserted that P.M.'s onset of sJIA occurred within two weeks of vaccination. Id. at 4 (citing exhibit 2 at 25).

The parties do not dispute that the onset of P.M.'s symptoms began within two weeks after receiving the vaccinations. Instead, the Secretary's experts argued that two weeks is not a medically acceptable timeframe to infer vaccine-causation. Both Dr. Platt and Dr. Rose cautioned against analogizing rheumatoid arthritis, which is an autoimmune disease, to sJIA, which is an autoinflammatory disease. See exhibit C at 9; exhibit E at 35. Further, Dr. Platt claimed that the anecdotes Dr. Brawer referenced describing patients experiencing an onset of rheumatoid arthritis within 24 hours following an adverse event are irrelevant to this case because P.M.'s onset occurred two weeks following vaccination. See exhibit C at 9.

Dr. Platt and Dr. Rose agreed that sJIA is an autoinflammatory condition caused by activation of the innate immune system. Id.; exhibit E at 40. Therefore, Dr. Platt opined, "An overactive innate immune response to the vaccine[s] would require a much shorter timeframe to trigger an autoinflammatory disease." Exhibit C at 9. Similarly, Dr. Rose asserted that onset of sJIA two weeks after vaccination is "way too long" for activation of the innate immune system. See exhibit E at 29-30, 40. Dr. Rose noted that if the vaccines were the cause, "P.M. would have shown fever, rash, or some degree of irritability, even if not the full-blown syndrome, within 24-48 hours" following vaccination. Id. at 30. Dr. Rose also discussed pathogen associated molecular patterns ("PAMPS") and damage associated molecular patterns ("DAMPs"), alarm signals that trigger an innate immune response. Id. at 25.

In response, Dr. Brawer argued that P.M.'s onset of sJIA did not occur until two weeks after vaccination because "the abnormal reactivity of [P.M.'s] innate immune system was not caused by PAMPs (pathogen associated molecular patterns), but was . . . triggered by DAMPS (damage associated molecular patterns)." Exhibit 38 at 1. He further explained that "several weeks can elapse before vaccination induced mitochondrial dysfunction can precipitate the onset of an autoinflammatory disease process." Id. at 2. He asserted that it is possible for weeks to pass "until the innate immune system encounters an 'alarm molecule.'" Id.

Dr. Rose responded that Dr. Brawer "provides no justification for why a two-week interval between vaccination and onset of sJIA is expected when

DAMPs are activated, as opposed to PAMPs." Exhibit F at 3. Dr. Rose stated that he has "never come across a distinction between DAMPs and PAMPs with respect to their relationship with sJIA onset." Id. Dr. Platt also noted that in Dr. Rose's initial report, he "specifically noted that both PAMPs and DAMPs are involved in rapid initiation of the innate [immune] response," which Dr. Brawer did not address. Exhibit G at 2 (citing exhibit E at 25-26). Given Dr. Rose's expertise in children's rheumatic diseases and experience treating patients with sJIA, his opinion on this point is persuasive. See exhibit B (Dr. Rose's CV); exhibit E at 1-4 (describing Dr. Rose's qualifications); see also McCabe, 2018 WL 3029175, at *55 (finding that a theory lacked credibility when it was "not even on the radar of those who specialize in the field").[4]

Dr. Brawer's attempt to analogize rheumatoid arthritis to sJIA with respect to an appropriate timeframe is not persuasive. As discussed above, sJIA is an autoinflammatory disease with a different pathogenesis from rheumatoid arthritis. Dr. Platt and Dr. Rose convincingly explained that given that sJIA is caused by an innate immune response, the onset of vaccine-induced sJIA would occur much more rapidly than two weeks following vaccination. Furthermore, Dr. Brawer failed to provide credible support for his contention that P.M.'s onset two weeks after vaccination was due to the involvement of DAMPs. Therefore, Mr. Moses has not met his burden of proof regarding the third Althen prong.

C. Althen Prong 2: A Logical Sequence of Cause and Effect

The second Althen prong requires a petitioner to show a logical sequence of cause and effect usually supported by the medical records. Althen, 418 F.3d at 1278; Capizzano, 440 F.3d at 1326.

Here, the logical sequence of cause and effect put forth by Mr. Moses lacks persuasiveness. Dr. Brawer asserted that P.M.'s sJIA was a "direct consequence" of the MMR, pneumococcal conjugate, and varicella vaccines because "P.M. did not suffer from any systemic inflammatory arthritis condition" before receiving the vaccinations, and other diagnoses were ultimately "discarded." Exhibit 19 at 2. In his second report, he elaborated that P.M.'s vaccines were a "direct cause" of his condition because "[a]ll other potential causes, including infections" were ruled out. Exhibit 32 at 4.

[4] Dr. Brawer has treated over 150 patients with juvenile arthritis over the course of his 44-year career. Exhibit 32 at 1. He did not state how many of those patients had sJIA.

In response, Dr. Platt asserted that Dr. Brawer's opinion assumes that sJIA has an "identifiable trigger." Exhibit C at 6. However, Dr. Platt explained that "there is no single precipitating cause that has been identified in research regarding sJIA." Id. He relied on the Lin article, which states, "Not one single triggering factor is responsible for the onset or exacerbation of JIA." Id. (citing exhibit C, tab 3 (Lin)). Dr. Platt also noted that "it is impossible to know that P.M. indeed did not have a viral or bacterial infection in the weeks prior to his disease onset." Id. Therefore, Dr. Platt concluded that the lack of another identified cause or triggering event does not establish a logical sequence of cause and effect connecting the vaccines to P.M.'s condition. See id.

Additionally, Dr. Platt asserted that P.M.'s robust response to anakinra is inconsistent with Dr. Brawer's causal theory that P.M.'s vaccines created cross-reacting autoantibodies. See exhibit C at 7-8. He explained that unlike medications used to treat autoantibody-driven diseases, "anakinra blocks IL-1, a cytokine that drives an innate immune response." Id. at 8. Dr. Platt noted that P.M. was not prescribed therapies used to treat autoantibody-driven diseases, such as rituximab or plasma exchange. Id. Dr. Rose agreed with Dr. Platt that because P.M. responded "fully" to anakinra, this is more consistent with the autoinflammatory etiology of sJIA, rather than an autoantibody-driven disorder. See exhibit E at 25.

Dr. Rose also pointed out that the timing of P.M.'s onset is inconsistent with Dr. Brawer's assertion that P.M.'s condition was a direct consequence of the vaccines. Exhibit E at 30-31. Dr. Rose noted that the medical records do not show that P.M. developed a fever, joint pain, irritability, or rash until two weeks post-vaccination. Id. at 31. Dr. Rose opined that if the vaccines were the cause of P.M.'s condition, he would have developed symptoms within 24-48 hours after vaccination. As discussed in section III.B, the timeframe in which P.M. developed symptoms of sJIA does not align with the etiology of the disease. Dr. Platt and Dr. Rose persuasively identified gaps in Dr. Brawer's theory that cast doubt on the logical sequence of cause and effect.

With respect to the second prong, the Federal Circuit has instructed special masters to carefully consider the views of treating doctors. Capizzano, 440 F.3d at 1326. Mr. Moses finds some support from P.M.'s treating physician, Dr. Chusid. Mr. Moses asserted that Dr. Chusid "strongly suspected that the vaccines caused P.M.'s condition." Id. He cited Dr. Chusid's record from July 17, 2016, in which Dr. Chusid wrote that P.M.'s fevers "started on 6/18/16 approximately 10 days

after receipt of [the] MMR vaccination . . . . Prior to that he had always been well . . . ." Id. (citing exhibit 5 at 237). Dr Chusid stated that he "[s]trongly suspect[ed] MMR was [the] trigger for onset of [P.M.'s] current inflammatory reaction given [the] temporal association." Exhibit 5 at 239. Dr. Chusid also recommended that P.M.'s primary care provider submit a VAERS report "for consideration of compensation for potential vaccine-mediated damage." Id. at 240.

Dr. Chusid's statement associating the MMR vaccine with P.M.'s sJIA is entitled to consideration; however, it is outweighed by contrary opinions from P.M.'s other treating doctors. See Myers v. Sec'y of Health & Hum. Servs., 13-885V, 2016 WL 7665435, at *7 (Fed. Cl. Spec. Mstr. Nov. 17, 2016) ("The views of treating physicians should also be weighed against other, contrary evidence also present in the record—including conflicting opinions among such individuals."). Dr. Kormanik, P.M.'s pediatrician, and Dr. Nocton, P.M.'s rheumatologist, indicated that the vaccines were not the cause of P.M.'s condition. See exhibit 47 at 35 (Dr. Kormanik refusing to sign a school waiver excusing P.M. from receiving the MMR vaccine because there was "no medical evidence to link" the MMR vaccine and P.M.'s sJIA); id. at 40 (nurse's note indicating that both Dr. Kormanik and Dr. Nocton recommended P.M. receive the MMR booster vaccine); id. at 20 (Dr. Gaethke's note indicating that Dr. Nocton did not believe the vaccines were the cause of P.M.'s sJIA); exhibit 15 at 131 and exhibit 16 at 163 (Dr. Nocton's recommendations that P.M. discontinue anakinra so that he could receive the MMR vaccine). Dr. Rose also noted that if Dr. Nocton believed that the vaccines were the cause of P.M.'s condition, he would not have advised P.M. to receive the MMR vaccination in 2019. Exhibit E at 31.

Although Dr. Chusid suspected that the MMR vaccine was the cause of P.M.'s condition, statements of a treating physician do not bind a special master to adopt his conclusions. Snyder v. Sec'y of Health & Hum. Servs., 88 Fed. Cl. 706, 746 n.67 (2009). Furthermore, the value of Dr. Chusid's statement is undermined by conflicting statements from P.M.'s other treating physicians concluding that the MMR vaccine was not the cause of his sJIA. See K.T. v. Sec'y of Health & Hum. Servs., 132 Fed. Cl. 175, 187 (2017) (one treating doctor's recommendation to avoid future vaccinations was counterbalanced by the opinion of another treating doctor); Hopkins v. Sec'y of Health & Hum. Servs., 62 Fed. Cl. 333, 335 (2004) (special master may reject the opinions from treating doctors favoring vaccine-causation when other treating doctors did not favor vaccine-causation). Therefore, Mr. Moses has not presented a logical sequence of cause and effect connecting P.M.'s vaccines to his sJIA.

Special masters have reached different conclusions in cases involving sJIA and JIA. Compare Jimenez v. Sec'y of Health & Hum. Servs., No. 17-1190V, 2021 WL 3179643, at *22-23, 26 (Fed. Cl. Spec. Mstr. June 23, 2021) (finding that cytokines from the hepatitis A and human papillomavirus vaccines can cause sJIA and accepting a one-week post-vaccination onset), and Cabrera v. Sec'y of Health & Hum. Servs., No. 13-598V, 2017 WL 510466, at *16 (Fed. Cl. Spec. Mstr. (crediting molecular mimicry as a theory by which the DTaP vaccine can cause JIA, an autoimmune disease, and recognizing a three-week post-vaccination onset as medically acceptable), with Koehn v. Sec'y of Health & Hum. Servs., No. 11-355V, 2013 WL 3214877, at *28 (Fed. Cl. Spec. Mstr. May 30, 2013) (rejecting the proposed temporal interval for a cytokine-mediated theory when the onset of sJIA occurred seven months following the human papillomavirus vaccine), mot. for rev. denied, 113 Fed. Cl. 757 (2013), aff'd, 773 F.3d 1239 (Fed. Cir. 2014), and Putman v. Sec'y of Health & Hum. Servs., No. 19-1921V, 2022 WL 600417, at *21-23 (Fed. Cl. Spec. Mstr. Jan. 31, 2022) (finding that the petitioner failed to establish that the MMR vaccine can cause JIA).

These cases do not weigh heavily in the analysis for three reasons. First, despite an instruction for the parties to cite any similar cases, Order, issued June 22, 2021, at 7, the parties did not discuss any similar cases in their briefs. Therefore, any arguments based on analogous cases appears to have been waived. Vaccine Rule 8(f)(1). Second, decisions of other special masters are nonbinding. Boatmon v. Sec'y of Health & Human Servs., 941 F.3d 1351, 1358 (Fed. Cir. 2019). Third, the differences in outcome in these cases may primarily derive from disparities in evidence. See Lampe v. Sec'y of Health & Human Servs., 219 F.3d 1357, 1368 (Fed. Cir. 2000) (recognizing that special masters may weigh evidence differently). As explained above, the evidence in this case is insufficient to establish, more likely than not, that P.M.'s vaccinations caused his sJIA.

V. A Hearing Is Not Required

Special masters possess discretion to decide whether an evidentiary hearing will be held. 42 U.S.C. § 300aa-12(d)(3)(B)(v) (promulgated as Vaccine Rule 8(c) & (d)), which was cited by the Federal Circuit in Kreizenbeck v. Sec'y of Health & Hum. Servs., 945 F.3d 1362, 1365 (Fed. Cir. 2018).

Mr. Moses has enjoyed a fair and full opportunity to present his case. After Dr. Brawer presented his initial opinions, Dr. Platt and Dr. Rose critiqued them, persuasively pointing out gaps and flaws in Dr. Brawer's reports. Mr. Moses then presented a rebuttal opinion from Dr. Brawer, which Dr. Platt and Dr. Rose again

critiqued. Mr. Moses had the opportunity to address the gaps in Dr. Brawer's opinion during the briefing process, but he devoted only three pages to the Althen analysis. See Pet'r's Br. at 9-11. In contrast, the Secretary spent approximately 17 pages pointing out faults in Mr. Moses's arguments on all three Althen prongs. See Resp't's Br. at 20-36. Mr. Moses's two-page reply requested a hearing but did not sufficiently address any of the Secretary's criticisms. See Pet'r's Reply, filed Jan. 3, 2022, at 1-2. Therefore, Mr. Moses's efforts to repair any deficiencies during the briefing process were not persuasive.

Mr. Moses was unable to offer a reliable theory by which the MMR, pneumococcal conjugate, or varicella vaccines can cause sJIA. Additionally, Mr. Moses's logical sequence of cause and effect lacked persuasiveness. Finally, the two-week time interval for P.M.'s onset of sJIA did not fit with innate immune-mediated nature of the condition. Therefore, a hearing would not resolve the problems in Mr. Moses's case.

VI. Conclusion

Mr. Moses has not met his burden of demonstrating that the MMR, pneumococcal conjugate, or varicella vaccines were the cause-in-fact of P.M.'s sJIA. Accordingly, the Clerk's Office is instructed to enter judgment in accord with this decision unless a motion for review is filed. Information about filing a motion for review, including the deadline, can be found in the Vaccine Rules, available through the Court's website.

IT IS SO ORDERED.

s/Christian J. Moran
Christian J. Moran
Special Master